RIDGEWOOD WATER COMMUNICATIONS

May 2008

System Overview

Ridgewood Water provides water service to the property owners in the four towns of Ridgewood, Glen Rock, Midland Park, and Wyckoff. Fire protection is also provided through approximately 1600 fire hydrants located along public right-of-ways in the four towns.

Water is primarily supplied from 55 Wells located throughout the four towns. 13 Interconnections with neighboring utilities provide sources for supplemental and/or emergency supplies. 275 miles of Water Mains, 4500 Valves, 12 Storage Tanks, and 11 Pumping Stations assist in the efforts of supplying water from the sources to the 60,000 customers. In all, over 70 facility sites comprise the Water System.

Operations of the Water System are controlled through a Central Control Facility located in Midland Park. From this location almost every facility is monitored and operated. Some sites require very little oversight, perhaps just observation of a water level in a tank. Others require operating, monitoring, and adjusting of numerous functions including intrusion alarms, pump speed, pressure monitoring, and water quality feedback.

Historic Perspective

Starting in the early 1900's in Ridgewood, the single wellfield supply was driven by coal fired steam (workers fed a coal fire to make steam at the wellfield location to drive the pumping units). The sole storage tank was monitored by visual inspection at the tank site. A secondary mirror system was installed in Midland Park in the late 1900's. In the 1920's electric drives replaced the coal fired steam and several remotely located wells were installed. The wells and tanks were still operated manually by going to a facility location and turning on or off the pumping unit or observing the tank water level. This remained the operating methodology through the 1940's.

In the 1950s, Ridgewood Water upgraded the operations and monitoring to a telephone based system. Technology had progressed to the point of enabling an electronic signal to be sent via telephone line to open or close a contact (essentially turn on/off a switch) and to transmit a rudimentary form of data via the strength of the electrical signal. The Telephone Utility allowed customers to lease dedicated lines, lines that only the customer could utilize. The state of the art system allowed Ridgewood Water to operate and monitor its facilities from a centralized location, greatly increasing the reliability of the water system.

Although a significant step forward, the system had its limitations. As treatment and water quality requirements have become more stringent, so has the equipment and its operating and monitoring needs. Beginning in the 1990's, computer based operations and monitoring have become the norm for any modified or upgraded facilities. The amount of data required to be transmitted taxes some of the leased lines and requires their upgrade.

Meanwhile, the Telephone Utility offers less and less support of their old lease lines. The field

personnel appear without adequate parts inventories when problems occur. Newer personnel are unfamiliar with the older equipment. Ridgewood Water personnel often assist/direct the Telephone personnel in the repair of the telephone equipment. Some lines remain inactive because the Telephone Utility just can't fix the problem.

In the fall of 2006, a lightning strike generated a surge of electricity that grounded in the main telephone line cabinet at Ridgewood Water's Central Control Facility. The resultant fire was extinguished in a matter of minutes, but the damage was done. Many communications were lost and facilities had to be operated as they were 100 year ago, by going to the site. The Telephone Utility appeared significantly taxed in their ability to repair/replace the damaged lines and junctions.

Options

Faced with the present situation, Ridgewood Water reviewed its options - stay with the present lease lines or seek alternate technologies/methodologies. The latter option seemed the only prudent course and two basic options avail themselves - Hardwire or Wireless.

> Could Ridgewood Water connect it's facilities together with a wire or cable? In the 1990's, several facilities had been interconnected with fiber optic lines, installed in the same trench with interconnecting water mains. This proved to be inexpensive as most of the cost to install the lines was being spent to install the required water main. However, there have been several problems with these lines. The expense of connecting all the facilities together would be cost prohibitive.
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> Wireless communications are available in three basic types - Cellular, Satellite, and Radio. (Note - All the wireless types of communication require some form of antenna.) Radio based communications have been used by many municipal and utility agencies for several decades and appears to be the most practical. Many of these rely on dedicated frequencies or frequencies that are shared by multiple users. Shared frequencies are not adequate for data transmission. A third option is to use recent technological advances that find a path across a range of frequencies. This negates the need to obtain a dedicated frequency, but the signal required is much stronger and requires a direct line of site between antennas. Thus, high antennas would be required at our sites. In the end, Ridgewood Water purchased dedicated frequencies from the FCC to transmit its data.

The dedicated frequencies and the radio based system will be very cost effective and reliable communications method for the Water System into the coming decades.

Materials

The installations will include self-contained radio equipment located inside each of the buildings or vaults, a wooden telephone pole (14" diameter at the base and tapering to about 8" at the top), a galvanized pipe (situated at the top of the pole as a connection and mounting devise for the antenna), and a small metal antenna (about 30" long and 6" high). The radio will be connected to the antenna with a small diameter cable that will be routed up the pole.

Interference with Municipal Radio and Equipment

Concerns were presented with interference with other radios and communications equipment that are in use in the proximity of the proposed installations. This will not be the case. The FCC has granted Ridgewood Water exclusive use of 2 frequencies. Unlike the municipal radios for Wyckoff and many of the surrounding towns, which share a frequency with other entities, these are dedicated frequencies.

Health Effects

There is much concern presented about health effects associated with electronic and radio equipment. Some of this concern dates back decades with electric transmission lines and persists today with large communications (cell) towers, cell phones, etc. Radio-frequency (RF) radiation, as it is termed, is generated by cell phones, microwaves, cordless phones, and municipal radios - to name a few common devises.

FCC documentation presents information from studies that have been conducted to understand the health effects of RF from these types of devises. Proximity and duration of exposure to RF comes into play with the health implications. Extreme operating conditions such as holding the antenna of a hand-held walkie-talkie radio within a centimeter or two of the users eye or head might have impacts/implications. But proper use of such devises shows no evidence of hazardous conditions.

Hand-held walkie-talkies are usually a few watts, more powerful models can be upwards of 10 watts. Mobile, car base units are 5 to 10 watts. Ridgewood Water's proposed units are 5 watts.

The point of exposure/proximity to the proposed units should be discussed. The units will be housed inside the buildings at each of the sites and are set inside their own protective enclosure. The FCC regulates the design and operation of these types of units and is also concerned with the workers that have to be in close proximity to the units during the coarse of their work. By far, the greatest level of risk of exposure to RF with the proposed system is the antenna. In these cases the antenna will be on top of a pole well above the ground level, several orders of magnitude less expose than a hand-held walkie-talkie.

Thus, not only are the proposed units on the lower end of the power scale, they will also be located well away from the neighboring residents. Given these conditions and the aforementioned studies on health implications, there will be next to no impact from these units on the health of our neighbors.

Fencing and Security

As a general rule, Ridgewood Water prefers to have fencing around the perimeter of its buildings and structures. Many of our facilities have fencing. However, several do not. Much of this situation comes down to the status quo: If a fence exists at a site, then there is a perception and acceptance of that fence. If a site is not fenced, then why should the situation be changed.

Ridgewood Water has not been required to install fencing by any State, Federal, or Local authority.

Beyond minimal vandalism, there has typically not been a historic problem with our sites and based on locations with and without fencing, fencing is not a deterrence to vandals.

Neighbors typically use our facility properties as extensions of their property and a local requirement to install fencing will likely lead to public opposition at some of the sites.

Property Values

Concern was expressed about the impact on property values.

Ridgewood Water has had numerous conversations and discussions the neighboring property owners at many of its sites and we get a wide variety of opinions and ideas about our facilities. Some are rather satisfied to have us as their neighbor. They tell us we are a quiet private alternative and would not want to have another entity on our property in place of the Water Utility.

Improvements, including modifications, expansions, reconstructions, and new installations, have

been made to quite a number of our facilities in recent years and in various degrees we have addressed the issue of property values and impacts thereon (including presentation to the Wyckoff Zoning Board). Many neighboring property owners perceive an impact from our facilities when we are making and improvement. They are used to the existing situation and concerned about change.

However, both through our projects and projects of other water utilities that have been reviewed there is a common thread of understanding - property values are not impacted by the types of facilities that we are constructing.

Professional Appraisers have looked at several of our sites and their opinion is consistent:

> The proposed facility will have minimal if any impact on the value of neighboring properties. Some evidence periodically exists where the value of a neighboring property is increased, as some people perceive the benefit of having a silent private neighbor. Devaluation of property is the perception of the existing owners because they have emotional attachment to the present situation of the neighborhood.

Their opinions are derived from a wide range of studies, of both our facilities and those of water facilities in other similar settings.

The improvements and projects sited in this section are typically major facility projects (i.e. reconstructing a tank or constructing a treatment facility). The installation of a telephone pole with a small antenna should pale in comparison to a major facility expansion/modification and have no impact on neighboring property values.

Aesthetics and Site Maintenance

With over 70 sites, Ridgewood Water has a daunting task to maintain all of it's properties. Since the late 1980's, there have been increased requirements on water quality and demand. Ridgewood Water has spent much of it's available resources meeting these requirements. Prior to this period, the facility sites were not necessarily in the best kept condition.

In recent years, Ridgewood Water has been spending time, effort, and capital to upgrade the appearance of it's sites. The process will take time and can be a sensitive one. We have started with some of the prominently located sites like our Russell Avenue Site. We removed significantly overgrown planting around the structure and replaced them with newer shrubbery. This has led to the need to address some aesthetic issues with the building, that had been hidden from view.

Over time and through cooperation with our neighbors and the local municipal entities we should be able to upgrade the appearance of our facilities and maintain them at a level that is commensurate with their surroundings.